

Case Study

# Columbia Area Career Center Project-Based Learning: A Formula for Rapid Results



**SREB**

High Schools  
That Work

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## The Setting

Columbia Area Career Center (CACC) is part of the Columbia Public School District of Columbia, Missouri, and serves the community by providing a variety of educational programs including, but not limited to: career and technical education (CTE), personal enrichment, literacy advancement, workforce development and summer camps.

CACC operates three career centers in the district and provides high-quality CTE instruction for 2,300 high school students, 4,200 adult students and more than 500 middle grades students (summer only). Public and private school students living in the district comprise 98 percent of CACC enrollment with high school students attending from three local districts, two county districts and four local private schools.

The center offers 65 courses in 17 programs of study. These include agriculture, automotive technology, broadcasting, culinary arts, computer programming, construction, digital media, health sciences and information technology. (See Appendix A.)

High school students taking CTE courses have opportunities to earn dual credit through partnerships with 14 postsecondary institutions. Students can earn industry-recognized credentials in nearly all program areas. CACC students annually participate in career and technical student organizations and bring home many state and national titles.

In 2014, CACC took reform steps to make its center a national leader in CTE by taking on a daunting and improbable task: implementing project-based learning (PBL) schoolwide in less than a year.

## Becoming a Technology Centers That Work Site

As part of the district's professional learning community initiative, the first challenge was to develop the pillars of a PLC: shared mission, shared vision and shared values. Throughout the 2012-13 school year, CACC faculty, staff and administrators spent considerable time reviewing and revising the mission, vision and core values of CACC. Subsequent decision-making and professional development centered around the tenets developed during that process.

When CACC programs expanded into two local high schools in 2013, additional faculty was needed. It also became apparent that curricula needed to be formalized in some program areas as the center moved from one- or two-teacher programs to multi-teacher programs. As CACC investigated ways to move the center forward, the driving principles of Technology Centers That Work (TCTW), a school improvement initiative of the Southern Regional Education Board (SREB), were viewed as valuable assets.



### CACC's Mission, Vision and Values

Mission: Preparing Today's Learners for Tomorrow's Careers

#### Vision:

- Empower students to achieve career and academic success.
- Be vital to the educational and economic growth of the community.
- Be a national leader in CTE.

#### Core Values:

- Teach, model and reinforce 21st-century skills, life and career skills and core academic skills.
- Prepare students to be successful in a variety of postsecondary options.
- Systematically evaluate curricula and upgrade facilities. Teach industry standards and deliver relevant assignments and assessments that reflect postsecondary and industry experiences consistent within departments.
- Participate in professional development opportunities that focus on student development and academic growth.
- Foster relationships and partnerships with business and industry and with student and professional organizations to promote collaboration, opportunities, work-based learning experiences and strong advisory committees.

CACC joined TCTW network of schools in July 2014 and immediately scheduled a Technical Assistance Visit (TAV) for fall 2014 in which a team of educators, community members and SREB staff visited the center to conduct a review of its school and classroom practices. The team provided a follow-up report to school leaders citing key priorities for improvement:

- Improve the quality of the CTE curriculum.
- Provide guidance and counseling for career planning.
- Provide extra help to CACC students to support their academic and CTE studies and to make smooth postsecondary transitions.
- Increase communication and collaboration with feeder high schools.
- Develop a culture of continuous improvement.



Marty Sugerik,  
SREB consultant

A TCTW representative led CACC administrators, members of the teacher leadership team, guidance counselors and CTE resource educators through a site development workshop to narrow the recommended actions. They identified two focus areas: 1) implementing project-based learning (PBL) and integrating academics into CTE instruction to create a culture of continuous improvement; and 2) improving the quality of the CTE curricula.

This case study profiles one of the largest project-based learning curricula overhauls of a multi-campus school district. The center teamed up with SREB consultant **Marty Sugerik** to help implement and fast-track PBL schoolwide in one school year. “I have traveled the country training and coaching schools and centers on how to implement PBL effectively for the past 16 years. They tackled this project head-on, and what takes most centers two to three years to accomplish, they have exceeded expectations in the first year,” says Sugerik.

## Focus Area 1: Getting Started With Project-Based Learning and the Integration of Academics

Course work in CACC classes has historically been heavily project focused, but after staff attended a two-day deep-dive session on PBL at the 2015 National TCTW Leaders’ Forum, CACC administrators knew the professional development SREB provided would allow teachers to move their existing projects to a deeper level of student engagement and learning. Sugerik was immediately scheduled for three years of intense PBL training.



Randall Gooch, CAAC director

Rather than identify a small cohort of teachers to train in PBL, as had been the TCTW formula, **Randall Gooch**, the center’s director, decided all CACC faculty, support staff and administrators would participate. “I told the administrative staff that if we implement this with every teacher, instruction would improve. All levels of teachers would experience universal, positive effects on instruction and students,” says Gooch. Typically, a smaller cohort of teachers would be trained early, and then expand to other teachers in the school. The goal behind the whole-group training was to expedite PBL implementation to see an immediate impact on student engagement and learning across all CACC.

Following the site development workshop, an instructional focus team was established to support and guide PBL implementation. The team, comprising four interested teachers and two administrators, was tasked with conducting peer reviews of completed PBLs, providing ongoing active support to all teachers throughout the school year and assisting with professional development planning. This team was key to the sustainability and effectiveness of PBL implementation. Sugerik notes, “Between SREB follow-up training and coaching, Columbia’s Instructional Focus Team provided the necessary support for a seamless transition. It is due to their efforts that the Columbia teachers were able to achieve success in design and implementation.”

## Year 1 PBL Implementation (2015-16 School Year)

In August 2015, Sugerik conducted two days of initial PBL training for 55 CACC faculty and administrators and 40 district practical arts teachers. This initial training guided teachers through the SREB design process to create projects that mirror problem-solving in the workforce. Teachers self-assessed their existing projects to identify areas that could be enhanced and explored resources and tools to meet the needs of their projects. This initial training was followed up with additional training and differentiated coaching to meet teachers where they were in their design and implementation.

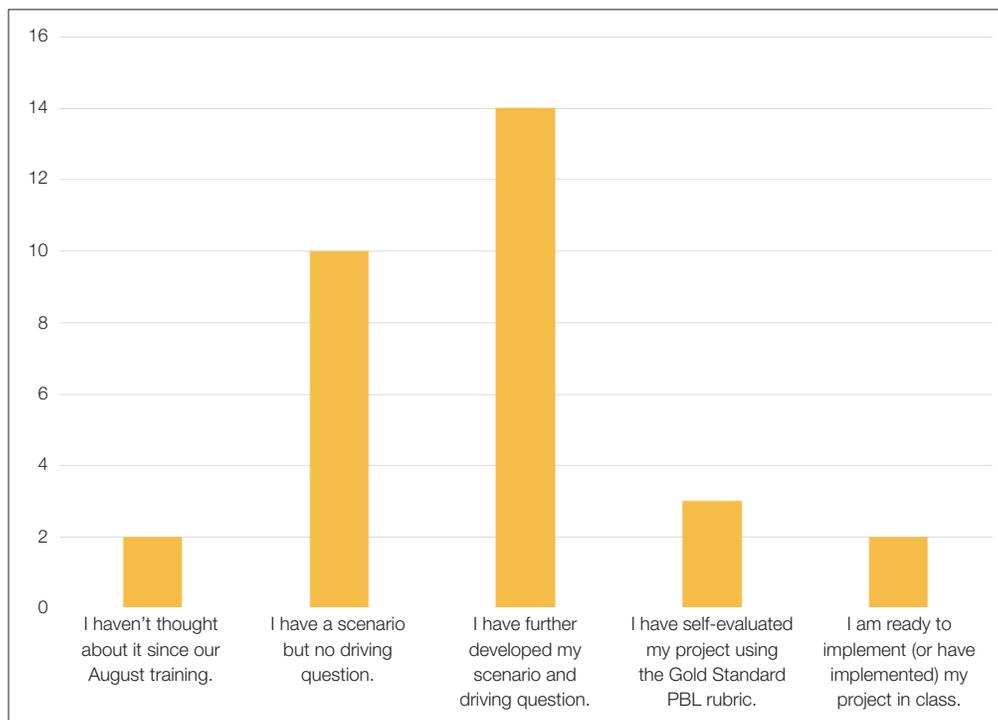
For such a large-scale implementation to be successful, there had to be clear expectations and full participation by all teachers. At minimum, for the initial two-day training, teachers were expected to develop and submit their project scenario to the focus team, which assessed the status of teachers' progress in developing and or implementing their PBLs.

They were also expected to create and implement one project by spring break of 2016. This was a critical expectation; it was imperative that all teachers experience the process rather than allow teachers within a department to work collectively on one project.

Teachers created projects around the elements of Gold Standard PBL Rubric, including the Essential Project Design Elements Checklist. See Appendix B.

Before Sugerik returned for follow-up training, an eye-opening moment at an October faculty meeting revealed teachers' commitment to PBL. The focus team polled teachers using a "human bar chart." See Figure 1.

**Figure 1: Year 1 PBL Implementation**



Teachers were asked to line up in front of the sign that best reflected where they were in the process. The team emphasized the importance of honesty and stressed that no one would be judged by responses provided.

Two of the teachers indicated they hadn't thought about it since the August training; 10 said they had a scenario but no driving question; 14 said they had further developed their scenario and driving question; three said they had self-evaluated their project using the Gold Standard PBL rubric; and two said they indicated they were ready to implement or had already implemented their project in the classroom. Most of teachers had at least a scenario, but it was clear few had done the work needed on developing a project.

In the following months, teachers participated in additional training, customized by Sugerik and the Instructional Focus Team. Breakout sessions were offered in the areas of developing quality driving questions, building reflection into projects, post-implementation reflection and other instructional strategies.

To provide teachers with needed time to develop individual PBLs, protected work time was built into the professional development schedule. During this time TCTW trainers provided teachers with individualized assistance. Teachers were required to submit a PBL project for peer-review by the focus team, which then gave written feedback based on the Essential Project Design Elements Checklist.



PBL professional development session

To stress the importance of PBL, the focus team recommended teachers take part in an open mic event and present their first-year PBLs to their peers and invited guests. This event was scheduled in April during a district early release day.

But before that, teachers assigned the projects to students who tackled them with a great deal of enthusiasm. Projects varied from one to two weeks to yearlong, and spanned a wide variety of subjects, including: game design, sawhorse construction, security systems and cake competitions. “I have been using a project-based learning style for many years, but the new PBL system has more depth to it,” states **Bob Allee**, 3D animation instructor. “The kids love working with this style and take ownership of their educational opportunity!”

## Projects and Success Stories

**Four- to Six-Page Spread: Sandy Morrow**, the graphic design and desktop publishing teacher, was contacted by the editor of “ZouNation” magazine, a publication of the Mizzou athletic community, with a request for students to design a four- to six-page magazine spread, with one being selected for publishing in a future issue.

The publisher and editor of the magazine, who were considered clients, met with students to outline the requirements for the spread and brought examples of their magazine to show students.

The clients used industry terms with the implied understanding that students would know the terminology and ask relevant questions. Students were provided the article title, the graphics and the article text to use in the spread. Midway through the project, each student met individually with the editor for feedback on layout and design ideas and then made edits based on that feedback. Students had to correctly submit their design to the client by the hard deadline.



Students design magazine spread

Morrow shared that students loved working for a client and receiving one-on-one feedback. They all felt the project was relevant, and they were excited and motivated to apply their design and software skills to meet the client’s needs and relished the possibility of their layout being included in a professional publication.

Students listened carefully to the client presentation, took notes and referenced notes as they worked on the project. Students felt they had learned so much more about the industry through this real-world project. They had a better understanding of what an authentic project encompasses — from tips to make their layout more professional to the time and precision required to produce a high-quality product.



Designing and building a sawhorse project

**Time is Money: Designing and Building Sawhorses:** Students in the introduction to construction and contracting class designed and built two sawhorses to practice their design, measuring and cutting skills. The main objective, however, was to determine how important time and cost of materials are in figuring cost effectiveness of buying pre-built sawhorses or building their own. Students calculated total work hours, materials used versus purchased and overhead expenses. The final cost was then compared to the price of pre-built sawhorses. Patrons at a local lumber company evaluated and provided feedback on the end product.

Their teacher, **Eric Radmer** discovered students whom he believed would struggle most with the project became the biggest success stories. Students were more engaged than with other projects and understood how overall production contributes to the final cost to the end user. Their tool skills improved, which led to a better end product. Patron feedback was well received; students respected opinions about their work and how their sawhorses might have been improved.

**Menu Design Collaboration PBL:** Students in **Carri Risner**’s baking and pastry class were asked this driving question: “How do you create a menu, using demographic research, historical research and menu design knowledge, while working collaboratively with the graphic arts department?” Students were tasked with doing demographic research of a city, choosing a food culture and style, and then researching information to adapt the new owner’s favorite recipes to follow those food trends. In addition, they inquired and investigated the psychology of menu design and their own food philosophy to better explain their dessert menu ideas to their graphic designer. Language arts standards that addressed domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context were also ambitious.

But the most arduous component for the students, from data received through reflection questions, was the collaboration with the graphic design students. Many struggled with the idea of how to explain their vision to someone else and how to get their designer to believe in their menu interpretation. They gained confidence throughout this assignment, which helped their efficacy throughout the year in other PBL assignments. This was the first of two PBLs related to their dessert menu. The next iteration was researching and developing, creating, plating, costing and presenting their dessert menu items to local pastry chefs and graphic artists. Their growth was obvious and tremendous from the first project to the last.

**Bank Design PBL:** In his Civil Engineering and Architecture II class, **Brad Mann's** students took on the role of designer for a civil engineering firm. Their job (or scenario) was to design a preliminary layout for a small branch bank that included a boundary survey, a topographic survey and the lot/site layout, which included a specific layout of the building on the given land, the parking lot, driveways, landscaping and utilities needed for the building. They also had to develop a presentation to submit their design to the client.



Bank Design Project

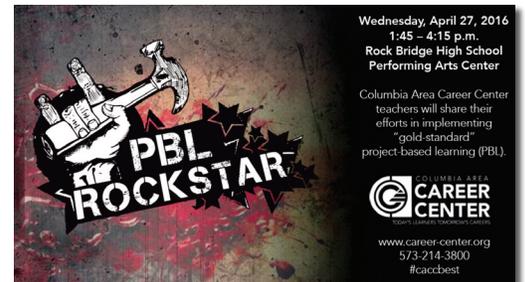
This “real-life” project came directly from a local engineering firm. The local firm provided the original footprint, or outer dimensions of the building, for the students to use as they worked their way through the design process. Mann explained what made this project so valuable is it took students through the entire design process and covered the whole array of engineering concepts. An engineer from the local firm came to the classroom and personally evaluated the students’ designs and provided feedback. “Hearing from a professional engineer gave the project validity in the students’ eyes,” says Mann.

## PBL Rockstars

After months of preparing for and implementing PBL in classrooms, teachers prepared to present their projects for the April open mic event. During an administrative meeting, CACC leaders discussed how well teachers had risen to the occasion and implemented their PBLs like rock stars. The theme of “PBL Rockstar” was born. A common template and script was created for the presentations, with each teacher asked to follow the same format.

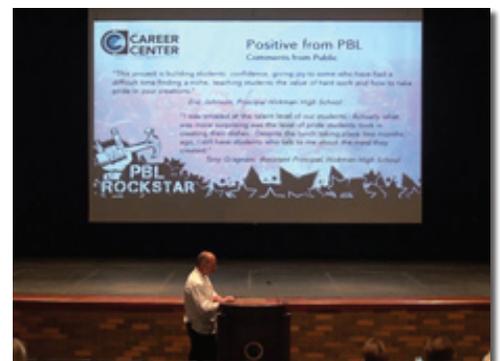
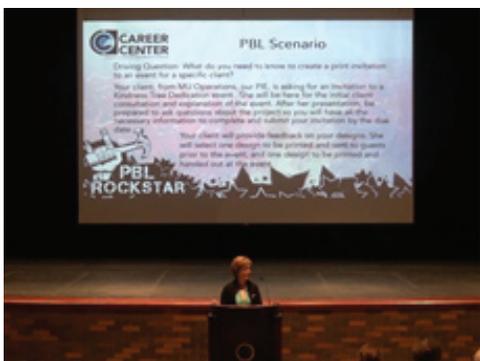
Invitations to the event were sent to district administrators, secondary school principals, Missouri CTE directors, and business and industry partners.

Time allowed for 23 of the 38 teachers to present their projects. Each teacher had five minutes to share the course in which they implemented their PBL, the project scenario, key learning objectives, graphics depicting the project and a positive quote about their experience. The remaining 15 teachers shared their presentations at a professional development in-service the following month.



## Year 1 Results

The results of Year 1 implementation were beyond expectations. All 38 teachers developed their own PBLs, with 37 implementing at least one PBL in the classroom during the school year. Eight teachers implemented two or more projects throughout the course of the year, two of which were cross-curricular in nature.



Teachers' PBL Presentations at PBL Rockstar Open Mic Event

There were some unintended, although helpful, results of the open mic event. Teachers gained valuable insight by hearing details of each other's projects — creating a spark that nudged several teachers to explore opportunities to develop more cross-curricular projects.

The administrative team and a group of teachers also presented CACC's first-year success at SREB's 30th Annual High Schools That Work Staff Development Conference in Louisville, Kentucky. Three administrators, one strategic communications manager, and seven teachers conducted five different conference sessions.

## Years 2 and 3 of PBL Training

After successfully completing the impressive task of implementing PBL schoolwide in one year, Years 2 and 3 of SREB professional development are being devoted to revising, refining and enhancing existing PBL, as well as developing new cross-curricular projects with teachers in different program areas.

Professional development is also devoted to training new teachers to use PBL, with veteran teachers and the focus team evaluating their projects, offering feedback and modifications to advance their projects to the Gold Standard PBL level.

A second open mic event was planned so teachers could present their projects to an expanded audience of peers, district administrators, business and industry, and other CTE centers around the state.

Teachers and administrators also plan to attend and present at the 31st Annual High Schools That Work Staff Development Conference in Nashville, Tennessee.

During Year 3, the instructional focus team will take on a larger role by providing PBL training for new teachers and supporting the PBL needs of veteran teachers.

## Lessons Learned

Overall, the administrative team agreed there are five keys to success when implementing PBL schoolwide:

1. Start with administrative commitment. Administrators must be involved in all aspects of the process, including planning, implementation and training.
2. Have high expectations for everyone involved and have specific checkpoints after every step.
3. Provide ongoing professional development support that is co-developed by teachers and is based on teacher needs.
4. Have a public product at the end and determine how you want your teachers to showcase projects.
5. Know your next steps. Planning is imperative to successful implementation and sustaining progress.

## Remaining Challenges

- Time constraints for teachers to collaborate on PBLs due to lack of common planning time and teachers located at multiple campuses
- Teacher commitment to continuous improvement and expansion of PBL projects
- Full teacher buy-in so that PBL development becomes a natural part of the curriculum design process

## Focus Area 2: Program Evaluation and Curricula Review

As CACC expanded to two additional high school campuses, teachers were hired to meet growing demands. With this staffing increase, it became evident many of the center's previously single teacher programs lacked documented written curricula. TAV analysis made it clear that CACC needed a comprehensive plan, which would allow teachers to conduct a more thorough program evaluation and develop a consistent, systematic curriculum for all courses.

During the spring and summer of 2015, CACC developed a comprehensive curriculum review and program evaluation process for implementation during the 2015-16 school year. A three-year cycle was developed whereby a given program area would go through: stage one — program evaluation; stage two — curriculum review/writing; and stage three — curriculum mapping. The cycle would then repeat. While stage 1 started with six program areas, all 17 program areas will eventually go through all three stages.

## Stage 1 – Program Evaluation

Program areas are asked to review their program using the Common Criteria and Quality Indicators for Career Education Programs developed by the Office of College and Career Readiness at the Missouri Department of Elementary and Secondary Education. The tool is very similar to SREB's Career/Technical Program Evaluation Tool.

Teachers rate their program area using a scoring rubric with six criteria and 27 quality indicators. Using the results of the self-assessment, teachers identify two to three of the most critical areas to focus their program improvement plans. Once the improvement plan is developed, teachers in the program area present it to the administrative team for discussion and approval. The three-year plan includes annual reviews on progress.

## Stage 2 – Curriculum Review/Writing

Three full-days during the school year are devoted to professional development related to curriculum writing and time to review and develop the curricula by program area. Training during this stage includes:

- Purpose and need for a prioritized curriculum
- Why a written curriculum is important and mandated as part of:
  - CACC's mission, vision and core values
  - TCTW initiative
  - Missouri CTE and quality indicators
  - Columbia Public Schools district policy
  - Needed by new teachers
- How to prioritize curricula
- Standard template for all courses and program areas
- Backward design
- Writing essential skills/measurable learner objectives
- Assessment



Deadlines are provided during each phase of the process and meetings with individual program areas are scheduled with administrators to review progress. The final product at the end of the curriculum review/writing stage is a curriculum guide for each course within the program area.

## Stage 3 – Curriculum Mapping

Once the curriculum guide is developed, teachers are asked to map as they teach during Stage 3. Teachers within a program area use three half-days during the school year to review mapping progress and make a final determination on essential skills/measurable learner objectives, assessments and major instructional activities for each phase of the curriculum map. Deadlines are provided during each phase of the process, and meetings are scheduled with administrators to review progress.

The expectation during this stage is for teachers to map the curriculum as the school year progresses and make sure all those teaching a specific course agree on the scope and sequence for that course. Once curriculum review and mapping are completed, the expectation is that all teachers of a given course follow the approved curriculum guide and map.

## Lessons Learned

- Based on teacher feedback from the first year of Stage 1, training was modified for the second year of implementation.
- Continued ongoing support and professional development are essential during curriculum review and program evaluation.
- Curriculum review and revision are critical for success of PBL.

## Remaining Challenges

- Time for teachers to collaborate on curriculum and program evaluation due to lack of common planning time and teachers in multiple buildings
- Teacher buy-in for the importance of evaluating programs and developing realistic, strong improvement plans
- Teacher buy-in for the importance of a planned, written curriculum that is mapped, followed and continuously revised as curricula change

## Policies and Support for School Improvement

### District policies and support

- Financial support from Columbia Public School District and Career Education Consortium
- Professional development and work time for teachers to:
  - Develop and implement project-based learning into curriculum.
  - Review and map curriculum.
  - Conduct program evaluation and develop program improvement plan.
- The district has adopted the mantra of “AEO”—Achievement, Enrichment and Opportunity. As a district, “all students graduate college- or career-ready; every teacher becomes the best; and our operations make our mission possible.”

### State policies and support

- Financial support from enhancement grants to purchase state-of-the-art equipment and resources to enhance learning environments
- Financial support from HSTW/TCTW Missouri state implementation grant to become a member of TCTW
- Professional development workshops and conferences that support CTE in Missouri
- Support for the HSTW/TCTW model

### TCTW policies and support

- Technical Assistance Visit which focused on improving curricula and instruction for all students who attend CACC
- Site development workshop to assist in prioritizing action steps from TAV
- All-faculty three-year PBL training
- Attendance and presentation at TCTW Leaders’ Forum
- Attendance and presentations at HSTW Annual Staff Development Conferences
- Attendance and presentation at ACTE (Association for Career & Technical Education) conference

### For more information about this case study contact:

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## APPENDIX A: COURSE OFFERINGS BY PROGRAM AREA

Agriculture	<ul style="list-style-type: none"> <li>Exploring Agriculture Science</li> <li>Animal and Veterinary Science</li> <li>Advanced Animal Science</li> <li>Agricultural Mechanics and Welding Technology</li> <li>Advanced Welding and Project Fabrication</li> <li>Small Engine Technology</li> <li>Intro to Plant Science and Greenhouse</li> <li>Floral and Plant Design</li> <li>Greenhouse Production</li> <li>Landscaping and Turf Management</li> <li>Urban Conservation Issues</li> <li>Wildlife, Conservation and Forestry</li> <li>Advanced Horticulture</li> <li>Agriculture Business, Communications and Leadership</li> </ul>
Automotive Technology	<ul style="list-style-type: none"> <li>Automotive Technology 1</li> <li>Automotive Technology 2</li> </ul>
Broadcasting	<ul style="list-style-type: none"> <li>Broadcast TV 1</li> <li>Broadcast TV 2</li> <li>Broadcast TV 3</li> <li>Broadcast TV Internship</li> </ul>
Culinary Arts	<ul style="list-style-type: none"> <li>Culinary Arts 1</li> <li>Culinary Arts 2</li> <li>Baking and Pastry Arts</li> </ul>
Certified Welding	<ul style="list-style-type: none"> <li>Certified Welding 1</li> <li>Certified Welding 2</li> <li>Certified Welding 3</li> </ul>
Computer Programming	<ul style="list-style-type: none"> <li>Introduction to Computer Science</li> <li>C++ Programming</li> <li>Advanced C++ Programming</li> <li>Advanced Programming Projects and App Development</li> <li>AP Computer Science A</li> </ul>
Construction and Contracting	<ul style="list-style-type: none"> <li>Construction and Contracting 1</li> <li>Construction and Contracting 2</li> </ul>
Digital Media	<ul style="list-style-type: none"> <li>Digital Media</li> <li>Digital Media Apps in the Cloud</li> <li>Digital Media Studio</li> <li>Graphic Design and Desktop Publishing</li> <li>Digital Filmmaking Essentials</li> </ul>
Engineering	<ul style="list-style-type: none"> <li>Computer Aided Design 1</li> <li>Computer Aided Design 2</li> <li>3D Animation Essentials</li> <li>3D Modeling and Animation</li> <li>PLTW Civil Engineering and Architecture</li> <li>Civil Engineering and Architecture 2</li> <li>PLTW Digital Electronics</li> <li>PLTW Introduction to Engineering Design</li> <li>PLTW Principles of Engineering</li> <li>PLTW Robotics and Computer Integrated Manufacturing</li> <li>PLTW Engineering Design and Development</li> </ul>

**APPENDIX A: COURSE OFFERINGS BY PROGRAM AREA (continued)**

Geospatial Technology	Digital Earth Geospatial Analysis Geospatial Technology Geospatial Internship
Health Sciences	Professions in Healthcare PLTW Principles of Biomedical Sciences PLTW Human Body Systems PLTW Biomedical Innovation PLTW Medical Interventions
Information Technology	IT Essentials Information Technology 1 Information Technology 2 Information Technology Internship
Lab Technology	21st Century Life Sciences Laboratory Exploration 101 Laboratory Foundations
Lasers and Photonics	Laser Technology Photonics 1 Photonics 2
Marketing	Entrepreneurship Marketing Marketing Store Management Sports and Entertainment Marketing Advertising and Promotion
Public Safety	Core Essentials of Firefighting and Public Safety Emergency Medical Technician-Basic
Teaching Professions	Foundations of Teaching and Instruction Teaching Professions Teaching Internship

Does the Project Meet These Criteria?	Evidence	Comments
<p><b>KEY KNOWLEDGE, UNDERSTANDING AND SUCCESS SKILLS:</b> The project is focused on teaching students key knowledge and understanding derived from standards (both core academic and technical), and success skills including critical thinking/problem solving, collaboration and self-management.</p>	<p>This could be in the form of:</p> <ul style="list-style-type: none"> <li>• Industry standards</li> <li>• Missouri Learning Standards (core academic standards)</li> <li>• Essential skills</li> <li>• MLOs</li> <li>• Course Objectives</li> <li>• 21st century – 4 C's</li> </ul>	
<p><b>CHALLENGING PROBLEM OR QUESTION:</b> The project is based on a meaningful problem to solve or a question to answer at the appropriate level of challenge for students, which is operationalized by an open-ended, engaging driving question.</p>	<p>Do you have:</p> <ul style="list-style-type: none"> <li>• a written driving question(s)</li> <li>• a real-world, authentic project scenario?</li> </ul>	
<p><b>SUSTAINED INQUIRY:</b> The project involves an active, in-depth process over time, in which students generate questions, find and use multiple resources, ask further questions and develop their own answers.</p>	<p>Where are your students being asked to:</p> <ul style="list-style-type: none"> <li>• generate questions (initially and over time)</li> <li>• utilize multiple resources</li> <li>• find solutions?</li> </ul>	
<p><b>AUTHENTICITY:</b> The project has a real-world context, uses real-world processes, tools and quality standards, makes real impact, and/or is connected to students' own concerns, interests, aptitudes and identities.</p>	<p>Are the students going to encounter this in a real job within regional or state industries? Where are the students encountering real-world:</p> <ul style="list-style-type: none"> <li>• processes</li> <li>• tools</li> <li>• quality indicators?</li> </ul>	
<p><b>STUDENT VOICE AND CHOICE:</b> The project allows students to make some choices about the products they create — how they work, and how they use their time — guided by the teacher and depending on their age and PBL experience.</p>	<p>Where are students having choice? This could be in the form of:</p> <ul style="list-style-type: none"> <li>• Their project/product</li> <li>• Procedural steps</li> <li>• Time management</li> <li>• Work commitment</li> </ul>	
<p><b>REFLECTION:</b> The project provided opportunities for students to reflect and write about what and how they are learning and about the project's design and implementation.</p>	<p>This could be in the form of:</p> <ul style="list-style-type: none"> <li>• Daily log/journal</li> <li>• Exit Strategy</li> <li>• Product review</li> <li>• Self-evaluation (before, during, after)</li> <li>• Share out</li> <li>• Revision stages</li> </ul>	
<p><b>CRITIQUE and REVISION:</b> The project includes processes for students to give and receive feedback on their work, to revise their ideas and projects or conduct further inquiry.</p>	<p>This could be in the form of:</p> <ul style="list-style-type: none"> <li>• Peer review</li> <li>• Self-evaluation</li> <li>• Industry expert feedback</li> <li>• Revised work</li> <li>• Multiple iterations</li> <li>• Teacher feedback</li> </ul>	
<p><b>PUBLIC PROJECT:</b> The project requires students to demonstrate what they learn by creating a product that is presented or offered to people beyond the classroom.</p>	<p>Where is the work shared outside the classroom and to whom?</p> <ul style="list-style-type: none"> <li>• Authentic audience</li> <li>• Content experts</li> </ul>	



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